

**REMARKS**

Claims 1-26 are currently pending in the present application, following withdrawal of claims 27-42 from consideration by the Examiner pursuant to the February 26, 2003 Restriction Requirement. With the foregoing amendments, claims 1-2, 4-14, 16-26 and 43-46 will be pending in this case.

Claims 1-2, 4-14 and 16-26 stand rejected under 35 U.S.C. § 102(e) as anticipated by, and alternatively under 35 U.S.C. § 103(a) as unpatentable over, U.S. Patent No. 6,291,094 to Yoshimura, *et al.* ("Yoshimura").

Claims 1-4, 13-16, 25 and 26 stand rejected under 35 U.S.C. § 102(e) as anticipated by, and alternatively under 35 U.S.C. § 103(a) as unpatentable over, U.S. Patent No. 6,090,228 to Hwang, *et al.* ("Hwang"), and under 35 U.S.C. § 102(b) as anticipated by, and alternatively under 35 U.S.C. § 103(a) as unpatentable over, U.S. Patent No. 5,798,188 to Mukohyama, *et al.* ("Mukohyama").

Finally, claims 2-3 and 14-15 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite for lack of definition of the term "a predetermined treatment."

**1. The § 112, Second Paragraph Rejection Has Been Addressed.**

The Applicant respectfully traverses the rejection of claims 2-3 and 14-15 under § 112, second paragraph, as indefinite for lack of definition of the term "a predetermined treatment." The Applicant has amended claims 2 and 14 to incorporate the limitations of claims 3 and 15, respectively, which define the predetermined treatment as "forming an underlying coating layer on the surface of the separator base material." Claims 3 and 15 have been cancelled, without prejudice to the subject matter contained therein. In addition, the Applicant has added new claims 43-46 to further defined the predetermined treatment recited in amended claims 2 and 14.

In view of the foregoing amendments, the Applicant maintains the term "the predetermined treatment" is adequately defined in amended claims 2 and 14, and respectfully requests the pending § 112, second paragraph rejections be withdrawn.

**2. The Claims, As Amended, Are Patentable Over The Cited References.**

The Applicant respectfully traverses the rejection of claims 1-2, 4-14 and 16-26 under § 102(e) as anticipated by, and alternatively under § 103(a) as unpatentable over, Yoshimura, and claims 1-4, 13-16, 25 and 26 under § 102(e) as anticipated by, and alternatively under

§ 103(a) as unpatentable over, Hwang, and under § 102(b) as anticipated by, and alternatively under § 103(a) as unpatentable over, Mukohyama on the grounds that these references do not disclose or suggest the invention recited in amended claims 1 and 13 and their respective dependent claims.

The Applicant has amended claims 1 and 13 to clarify that the metal coating layer has a particular structure -- “a non-porous crystalline structure,” *i.e.*, a structure that results from having melted and gradually cooled a coating layer metal on the separator base material. Thus, the Applicant has focused the claims on a distinguishing physical characteristic of the metal coating layer, rather than defining the invention in product-by-process terms.

These amendments are fully supported in the original specification. In particular, the Applicant specifically discusses how the melting of the coating layer metal creates a layer that fully covers the separator base material, and thereby provides superior protection from the fuel cell environment than other coating layers, such as the metal layer structure left by an electroplating process. *See, e.g.*, Application at 18:28-33 (“Normally, a plating layer formed by plating has pinholes (small holes) (hereinafter, referred to as micro plating-defects). A layer located under the plating layer may possibly be subjected to corrosion through these micro plating-defects. In this embodiment, the low-melting-point metal is subjected to the melting process in order to reduce the number of micro plating-defects in the metal coating layer 64 as described below.”).

The differences in physical structure of the metal coating layer distinguishes the present invention’s separators from those of the cited references. In Yoshimura, the coating layer is formed by electroplating, a process that results in a coating layer structure with micro-defects -- exactly the structure that the present specification uses as an example of a less desirable structure. *See, e.g.*, Yoshimura at 6:35-37; Application at 18:28-33. Moreover, while Yoshimura briefly mentions alternatives to electroplating, including sputtering and spraying with high heat oxidation (Yoshimura at 8:66-9:8), none of these alternatives provide a non-porous crystalline structure of the present invention, *i.e.*, Yoshimura suggests only coating layer structures that result from deposition of individual metal particles, with highly localized heating at impact or at exposure to oxidizing temperatures -- processes that do *not* result in the same non-porous crystalline structure that is achieved by the generalized melting and flow of material to eliminate defects as in the present invention.

Similarly, Hwang does not teach or suggest the creation of a separator with the present invention’s crystalline structure in its coating layer. Hwang instead teaches the

deposition of an Aluminum film on a base plate (or an undercoated base plate), and heating to high temperatures *to cause the Aluminum to chemically react with the underlying metal*. Hwang at 3:54-66 (“... is thermally treated ... 660-700°C ... [u]nder this process, aluminum is diffused into the nickel coating layer”); 4:32-39 (“the base material coated with aluminum is thermally treated ... to make the base material and the aluminum to react, to thereby form a diffusion layer). There is no teaching or suggestion that the resulting Hwang separator coating layer has any crystalline structure at all (since its atoms have chemically reacted with, and/or diffused into, the underlying metal) -- let alone a teaching of a non-porous structure like the separators recited in claims 1 and 13, wherein the coating layer metal has had the opportunity to flow and gradually cool into a non-porous structure without significant micro-defects.

Finally, as to Mukohyama, this reference teaches nothing with respect to the present invention's non-porous crystalline structure. Indeed, the only discussion of the metal coating layer in this reference is a single sentence that merely states that the metal coating may be applied by sputtering, chemical vapor deposition or physical vapor deposition -- all techniques that, as discussed above, do not result in a layer structure like the present invention's melted-and re-cooled structure.

In view of the cited references' failure to teach or suggest the non-porous crystalline structure of the present invention's metal coating layer, the Applicant respectfully submits claims 1 and 13 and their dependent claims are patentably distinct over the cited references under §§ 102(b), 102(e) and 103(a). Reconsideration and withdrawal of the pending rejections is therefore respectfully requested.

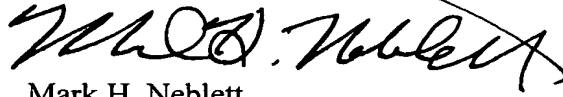
### **Conclusion**

In view of the foregoing amendments and remarks, it is respectfully submitted that the foregoing amendments place the presently pending claims in condition for allowance. The Applicant therefore earnestly solicits issuance of a Notice of Allowance for claims 1-26 and 43-46.

The Examiner is invited to contact the undersigned at (202) 220-4232 to discuss any matter concerning this application.

No additional fees are believed to be required in connection with this submission.  
Nonetheless, the Applicants authorize payment of any additional fees under 37 C.F.R. § 1.16  
or § 1.17 or credit of any overpayment to Deposit Account No. 11-0600.

Respectfully submitted,



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